

Personnel Research and Development Center

San Diego, California 92152-6800

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January 1992



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FY91 Bibliography of Reports

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**Navy Personnel Research and Development Center
San Diego, California 92152-6800**

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Foreword

The Navy Personnel Research and Development Center (NPRDC) is an applied research center, contributing to the personnel readiness of the Navy and Marine Corps. The Center develops better ways to attract qualified people to the naval services, to select the best, to assign them where they are most needed, to train each one effectively and efficiently, and to manage our personnel resources optimally. By combining a deep understanding of operational requirements with first-rate scientific and technical abilities, the Center is unique in being able both to develop new, useful knowledge and to refine technology to address people-related issues. This dual expertise permits the Center to develop the technology base for improving the use of human resources within Navy systems and to apply state-of-the-art technology to solve emerging problems.

The R&D methods used by NPRDC are derived from behavioral, cognitive, economic, and social sciences as well as from applied mathematics and statistics. The application of these methods results in tangible products of use to the Navy and Marine Corps. NPRDC constantly searches for technological opportunities to improve personnel readiness and to reduce manpower costs. We are accountable to the Bureau of Naval Personnel, our sponsors, and our users for high productivity, strict ethics, honesty, integrity, professionalism, and perspective.

NPRDC seeks to do as much of its work as possible in the operational setting where the final products of the effort are intended to be used. This helps to ensure that the needs and requirements of the users are met and that the users themselves become familiar with the operational capabilities of the particular products.

This bibliography contains an abstract of each report prepared by NPRDC personnel and published and approved for public release in FY91.

Reports are listed in appropriate subject categories for reference convenience. The scope of each category is defined below.

Manpower develops new systems and methods for determining manpower requirements, allocating manpower resources, developing personnel inventories, and distributing/assigning those inventories to improve military readiness and control costs.

Personnel develops and evaluates systems for officer and enlisted personnel selection, classification, and assignment. Serves as the

Foreword

Lead DoD R&D Laboratory for selected Joint-service programs, (e.g., the Computerized Adaptive Testing Version of the Armed Services Vocational Aptitude Battery (CAT-ASBAB) program, including the development and evaluation of new computerized tests). Develops and evaluates screening instruments to reduce attrition and maximize effective performance. Manages and performs R&D and scientific support for the Joint-service Job Performance Measurement (JPM) Program.

Education and Training develops training technologies to enhance personnel readiness. Employs existing and emerging technologies in the development and application of training systems to alleviate Navy training problems and improve the Navy's operational readiness.

Organizational Systems conducts research, development, test and evaluation on Department of the Navy organizations. The principal criteria are effectiveness, quality of products and services provided, efficiency, timeliness, and cost. Serves as the Chief of Naval Operations' primary personnel survey resource to coordinate and conduct attitude surveys in the Navy and Marine Corps and to develop new survey technologies.

Administrative Publications (APs) are formal reports on significant matters relating to the technical program, management, or administration of the Center. APs also include informational, orientation, and recruiting brochures.

Qualified users may request copies of publications from the Defense Technical Information Center (DTIC), Cameron Station, Alexandria, Virginia 22314 (Telephone: Commercial (202) 274-7633 or Defense Switched Network 284-7633). General public may order from the National Technical Information Service (NTIS), Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (Telephone: Commercial (703) 487-4650). When placing report orders, it is helpful to provide NTIS with the AD number.

THOMAS F. FINLEY
Captain, U.S. Navy
Commanding Officer

RICHARD C. SORENSON
Technical Director, Acting

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Manpower

Technical Notes

NPRDC-TN-91-10
April 1991
(AD-A235 316)

T. A. Blanco

***Assessment of Navy Personnel Geographic Stability or
"Homesteading" in the 1980s***

This report contains a survey of past research and Navy initiatives in the area of personnel geographic stability or homesteading and documents lessons learned on why these initiatives have failed. The report also contains a quantitative assessment of informal homesteading through consecutive sea/shore rotational assignments and follow-on sea tours in the same geographical area. The report concludes that the regional sea/shore billet structures for sea-intensive ratings, such as boiler technicians and machinist's mates, do not support a formal homesteading guarantee program, but that the current Navy distribution and assignment system already provides considerable homesteading opportunity to career sailors home ported in five major fleet concentration areas: San Diego, Norfolk, Mayport, Seattle, and Charleston. As of September 1989, informal homesteading seemed to be working better than ever, and the negative aspects of a formal homesteading program would far outweigh any potential gains.

NPRDC-TN-91-16
June 1991
(AD-A237 162)

T. J. Thompson
I. A. Krass
T. T. Liang

***Quantifying the Impact of the Permanent Change of
Station (PCS) Budget on Navy Enlisted Personnel Unit
Readiness***

The Navy spends over \$600 million annually to move its active duty personnel. This report describes a model that relates permanent change of station (PCS) moves to personnel readiness. To support this model, a readiness measure, which can distinguish among small differences in manning levels, was developed. Using a hypothetical PCS move plan for a 5-month time horizon, we show the effect of a reduced moving budget. The current move plan is for 17,300 moves while the reduced budget plan calls for 14,495 moves. The reduction in moves translates to a decrease in readiness.

Personnel

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NPRDC-TR-91-5
January 1991
(AD-A231 303)

R. L. Burch
J. P. Sheposh
R. F. Morrison

Officer Career Development: Surface Warfare Officer Retention

The factors that contribute to surface warfare officer retention in the Navy were investigated. Information was obtained from a sample of 373 stayers and 52 leavers selected from a larger sample of 3,059 surface warfare officers who responded to a survey of officer career development in 1986. An hypothesized model of surface warfare officer retention, based on Steers and Mowday's model of employee turnover (1981), was tested using path analyses. The results of the analyses supported several of the major linkages contained in the model. In line with the model, stated career intent had the strongest influence on officer retention. Additionally, search for alternatives had a direct impact on retention. Level of organizational commitment, along with spousal support and tenure, had a direct influence on career intent. The direct links from spousal support, esteem, assignment acceptability, and benefits to organizational commitment were also supported. Overall, the present study contributes to our understanding of the turnover process within a military setting and provides avenues for future research.

NPRDC-TR-91-8
March 1991

R. A. Bruce

The Career Transition Cycle: Antecedents and Consequences of Career Events

This research addressed the meaning of the career transition cycle for the individual and the associated adjustment that occurs. Specifically, the influences that role perceptions and characteristics of career events have on adjustment difficulty, eagerness, and strain experienced by individuals going through career events were investigated.

Questionnaire data from 1,301 Navy aviators who either recently had gone through one of six types of career events (e.g., initial socialization, obtaining full membership, resignation, upward progression, lateral career moves, and retirement) or were about to go through such career events were analyzed. Louis' theoretical typology for the career events was supported.

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NPRDC-TN-91-2
December 1990
(AD-A231 304)

S. E. Devlin
N. M. Abrahams

Assessment of Differential Prediction by Race for the USNA Classes of 1986-1990

The United States Naval Academy (USNA) uses the Candidate Multiple (CM), a composite of several measures, to evaluate applicants. This composite seeks to predict many aspects of USNA performance. While the USNA strives for equal opportunity, the CM has not been evaluated for fairness for some time. Toward that end, the CM was evaluated using the widely accepted regression model of test fairness. This model effectively states that a test is biased for a subgroup if it consistently over- or underpredicts the performance for members of that group. Using this model, procedures were used to statistically assess whether a prediction system based on the CM is fair to Blacks when the system for predicting academic performance is developed on a combined sample of Blacks and Whites. In essence, these procedures are aimed at determining whether a separate regression equation (i.e., prediction system) for members of the minority group would provide a more accurate and equitable prediction of their performance. These analyses revealed a statistically significant difference between separate prediction systems. This difference, while statistically significant, increases prediction by only about three-fourths of one percentage point. Thus, the use of separate equations does not provide a meaningful improvement in the prediction of academic performance. Finally, since Black academic performance scores were generally overpredicted when the combined-group regression equation was used, a combined-group regression equation does not adversely impact upon the Black minority. It is therefore recommended that the USNA continue using a single prediction system.

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NPRDC-TN-91-3
December 1990

R. L. Burch
N. M. Abrahams
J. E. Edwards

Development and Evaluation of a High School Rating Conversion Table for NROTC Applicants

Naval Reserve Office Training Corps (NROTC) scholarship applicants are evaluated, in part, on their high school rating (HSR). HSR is a selection variable that reflects individuals' percentile rank in their high school class. For those applicants who are missing a percentile rank, their HSR must be estimated using their high school grade point average (HSGPA). The current HSGPA-to-HSR conversion table has been used to estimate individuals' HSR for several years. Recently, Chief of Naval Education and Training (CNET) officials have questioned whether the conversion table overestimates HSR when a student's high school rank is unknown. The purpose of the present study was to evaluate the accuracy of the current HSGPA-to-HSR conversion table and to develop a revised HSGPA-to-HSR conversion table. An equipercentile method of equating was used to develop the revised HSGPA-to-HSR conversion table. Cross-validation of this table was conducted on a holdout sample, and comparisons between the table currently in use and the revised table were performed. The results showed that the current HSGPA-to-HSR conversion table does overestimate HSR. A revised HSGPA-to-HSR conversion table was substantially more accurate than the current conversion table for estimating individuals' HSR. This finding is important due to the large weight assigned to HSR in the current NROTC selection composite. It is recommended that the revised HSGPA-to-HSR conversion table should replace the table currently in use. When sufficient criterion data become available, the predictive validity of the revised HSR table should be evaluated.

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NPRDC-TN-91-4
January 1991
(AD-A231 302)

R. E. Chatfield
S. A. Gullett

Development of a USMC Officer Assignment Decision Support System: General Design Specification

This general design specification was completed as part of the Life Cycle Management (LCM) process for development of an Officer Assignment Decision Support System (OADSS). This document details users' requirements for enhanced capabilities for carrying out assignment of Marine Corps officers and describes the Automated Data Processing Equipment (ADPE) environment required to meet the proposed system's objectives. Deficiencies in the current assignment system, as well as capabilities of the proposed system designed to correct them, are summarized. General design specifications are based primarily upon derivation of the New Physical Model that was established via prescribed structured analysis techniques. This model is composed of three primary components: (1) data flow diagram, (2) data dictionary, and (3) mini-specifications governing the transformation of input data flows that mini-systems perform at the primitive functional level. A Data Flow Diagram (DFD) is provided to graphically represent data flows into and out of the seven functional mini-systems (processors). Also, an Entity-relationship Diagram (ERD) is presented that partitions data elements into homogeneous groups or entities. Finally, factors such as organizational context, new performance characteristics, and information requirements affecting system development are discussed as well.

NPRDC-TN-91-5
March 1991

M. D. Thomas
P. J. Thomas
V. McClintock

Pregnant Enlisted Women in Navy Work Centers

This report documents an effort to determine the amount of lost time due to pregnancy and to assess perceptions of supervisors and their pregnant subordinates regarding the effect of pregnancy on the workplace. Data were collected from pregnant enlisted women receiving medical care at San Diego and Tidewater area Navy prenatal clinics using a structured interview. A special purpose survey was sent to the current and former supervisors of the interviewed women.

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Key findings included:

1. Lost time due solely to pregnancy amounted to 1 day per month per pregnant woman in the San Diego and Tidewaters areas.
2. The impact of pregnancy on the work center and on the command was seen as greater on ships than at shore commands.
3. Until the third trimester, most women continued to work normal shifts and hours in their rating during their pregnancy.
4. Most co-workers and supervisors tended to respond positively to the news of pregnancy.

NPRDC- N-91-6
March 19 1

R. A. Bruce
G. L. Russell
R. F. Morrison

Officer Career Development: The Post-resignation Survey

The naval aviation community is faced with the problem of retaining its officers in sufficient numbers to meet its requirements for officers with more than 10 years of experience. This research followed aviators who had resigned from the Navy between 1982 and 1986. In general, the officers were satisfied with their decision and thought very highly of many facets of their naval experience. However, their impressions of the amount of paperwork, crisis management, detailers, work hours, and sea duty were unfavorable with the impressions of the first two factors becoming even worse in comparison with their civilian experience. It is recommended that detailing and assignments be separated on the Officer Separation Questionnaire and realistic preparation for non-flying duties be initiated early in flight training.

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NPRDC-TN-91-7
March 1991
(AD-A234 874)

G. L. Wilcove
R. F. Morrison

Officer Career Development: Factors that Predict Subspecialty Decisions and Proven-subspecialty Status

The goal of the present effort was to help the Navy more fully meet its need for technical and acquisition-management specialists at intermediate and senior grade levels. Toward that end, the research attempted to identify those factors that would predict who would become a proven subspecialist in the targeted grade levels and who would remain totally committed to a warfare specialty. The researchers believed that proven-subspecialty status is the culmination of the following: (1) the perceived value of subspecialties for career advancement influences the officer's decision on whether to obtain a proven subspecialty, (2) the decision to obtain a proven subspecialty requires a decision on whether to obtain a postgraduate degree, and (3) since attendance at postgraduate school is voluntary, the decision to pursue that goal should be a good predictor of proven subspecialty status. Three FY82 questionnaire-determined factors, used in combination, produced the best predictions of proven subspecialty status in FY86/87: the proven-subspecialty and postgraduate-degree decisions, and operational mission. These predictors produced a fairly high correlation of .49. Recommendations were offered on how to motivate officers to assume more responsibility for the development of subspecialty expertise.

NPRDC-TN-91-8
March 1991
(AD-A235 294)

G. L. Wilcove
W. C. Wilson

Officer Career Development: Measures and Samples in the 1981-1989 Research Program

Since 1981, NPRDC has been conducting research on the career development and management of aviation warfare officers, surface warfare officers, and general unrestricted line officers. The research was designed to provide information to policy makers and career managers from the officers themselves, so that the Navy would be in a better position to: (1) manage the careers of its officers, (2) fill billets with skilled individuals at all grade levels, and (3) improve performance and increase retention. The research design emphasized multiple cohorts and repeated measures.

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Ten questionnaires were used in the study, together with interviews. The research also include a secondary cross-sectional feature. The present report describes: (1) the classes of variables measured in the research program, (2) the sampling strategies, and (3) the characteristics of the respondent samples. It also evaluates the representativeness of the samples.

NPRDC-TN-91-9
April 1991
(AD-A235 171)

R. E. Chatfield
S. A. Gullett

Development of a USMC Officer Assignment Decision Support System: Project Management Plan

This Project Management Plan was completed as part of the Life Cycle Management (LCM) process for development of an Officer Assignment Decision Support System (OADSS) for the United States Marine Corps. This document summarizes tasks required to develop OADSS, provides a tentative schedule for milestone deliveries, and discusses resources required throughout the system's life cycle. The five sequentially completed phases of the LCM process are discussed: (1) Mission Analysis/Project Initiation Phase, (2) Concept Development Phase, (3) Definition/Design (DEF/DES) Phase, (4) Development Phase, and (5) Deployment/Operations Phase. The report also summarizes documents associated with each phase that facilitate management accountability and program coordination throughout OADSS' life cycle. It is recommend that a General Design Specification be completed as the next stage in the DEF/DES Phase of system development.

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NPRDC-TN-91-18
August 1991
(AD-A239 663)

J. Kantor

The Development of an Experimental Structured Interview Protocol for Armed Forces Health Professions Scholarship Program Selection

An increasingly large percentage (67% in FY88) of naval medical officers resign after their initial obligations are fulfilled. Since over three-fourths of the commissioned physicians are Armed Forces Health Professions Scholarship Program (AFHPSP) participants, the Navy would save scholarship expenses by accepting only those applicants who are most likely to choose a naval career. In order to accomplish this objective, the selection process of the AFHPSP applicants needs to be improved. The present effort concentrated on one aspect of the selection composite, the development of an experimental structured interview protocol to objectively assess the career motivations and aptitudes of AFHPSP applicants. The new interview protocol, after validation, would replace the current interview form and may improve the selection of naval career-oriented applicants. The new protocol is theoretically sound and was well received by a sample of recruiting officers and medical officers. However, its reliability and validity need to be determined before its implementation. Recommendations are provided for the short-, intermediate-, and long-term validation of the new structured interview protocol.

NPRDC-TN-91-21
August 1991
(AD-A240 574)

E. W. Kerce
G. Wilcove

Effects of Loma Prieta Earthquake on Navy Members and Families

Navy members and spouses who were present in the San Francisco Bay Area when the October 1989 Loma Prieta Earthquake occurred were surveyed to examine utilization and effectiveness of support services available to them after the earthquake; and to assess the extent of psychological, behavioral, and physical symptoms experienced following the disaster. Disaster-related effects on performance and morale of area commands were investigated. Survey data were supplemented by interviews with selected command leaders and service providers. Spouse respondents reported more symptoms, more needs, and more services used than military respondents. The principal need expressed by both military

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members and spouses was "someone to talk to." Thirty-nine percent of military respondents and 61 percent of spouse respondents reported experiencing stress-related psychological or physical symptoms. Difficulty sleeping and general anxiety were common symptoms. Spouses of deployed military members experienced more stress-related symptoms than other groups. Coping style was shown to have a significant effect on the number of symptoms reported and how long such symptoms lasted. Individuals who relied on informal sources of support suffered more stress-related symptoms than those who coped in other ways. The majority of military respondents did not feel that their own performance or morale was affected by the earthquake and command leaders generally concurred.

NPRDC-TN-91-22
September 1991

R. L. Burch
N. M. Abrahams

Development and Validation of an Enhanced NROTC Selection System

The Naval Reserve Officer Training Corps (NROTC) selection system, in use since 1987, has been helpful in predicting college grade point average, naval aptitude grades, and naval science grades. In recent years, the Navy's desire to increase the number of individuals graduating with engineering or science degrees has made revision to the current selection composite necessary. Development of the new composite entailed the evaluation of alternative predictor composites and the addition of a new criterion (i.e., an individual's final major). While these composites were designed to improve prediction of all criteria, there was particular emphasis on predicting technical major. Multiple regression was used to optimally weight academic ability, high school performance, vocational interest, engineering/science interests, background characteristics, and personal attributes. The revised composite contained all the predictors except for the engineering/science scale. A separate expectancy table was developed for evaluating an individual's engineering/science score. The new selection composite increased the ability to predict technical major over that of the current selection composite without decreasing the ability to predict the remaining three criteria.

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NPRDC-TN-91-23
September 1991
(AD-A241 363)

G. L. Wilcove
R. L. Burch
A. M. Conroy
R. A. Bruce

Officer Career Development: A Review of the Civilian and Military Research Literature on Turnover and Retention

Reviews were conducted of both the civilian and military research literatures on turnover in preparation for a predictive study involving aviation warfare officers and actual retention behavior. In the present report, results from the two literature reviews are presented and compared. An annotated bibliography, which has been computerized, is also presented, and is available on disk upon request. Both the literature reviews and the subsequent retention study were part of a 9-year research program that examined a wide range of career development and career management issues for three unrestricted line officer communities: aviation warfare officers, surface warfare officers, and general unrestricted line officers.

NPRDC-TN-91-24
September 1991
(AD-A242 498)

R. A. Bruce
R. L. Burch
G. L. Russell

Officer Career Development: Cross-sectional Sample--Fiscal Years 1986-1987

An extensive research project was initiated in 1982 which investigated the career development and decision-making processes of three communities of naval officers. An officer career questionnaire was sent to a sub-sample ($N = 20,999$) of the larger population of aviation, surface warfare, and general unrestricted line officer ($N = 23,769$). These questionnaires were administered during 1982 and then readministered during 1986-1987.

As a result of this study, two databases were constructed: (1) a cross-sectional database that includes data for all individuals who completed a survey in FY86-FY87 ($N = 12,319$), and (2) a longitudinal database that includes data for all individuals who completed a questionnaire in FY82 ($N = 9,109$) and in FY86-FY87 ($N = 5,633$). The present document outlines the column locations for each variable in the cross-sectional database.

Those that wish to access the database to conduct additional analyses, link it to or combine it with other databases, enlarge the database for the conduct of trend analyses, etc., will find this data dictionary an essential aid.

Education and Training

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NPRDC-TR-91-1
October 1990
(AD-A228 791)

G. B. Semb
J. A. Ellis
W. E. Montague

Long Term Memory for Knowledge Taught in School

This study examined students' retention knowledge-based college course content after 4 and 11 months. Retention was evaluated for group-paced and self-paced instructional delivery. The study focused on the ability to recognize information learned in school. There were no measures of the ability to recall information or solve problems. The results indicated that: (1) students retained approximately 85 percent after 4 months and about 80 percent after 11 months; (2) self-paced students performed significantly better on all tests at both intervals than did group-paced students; (3) the amount of information lost did not differ significantly between groups across the two retention intervals and; (4) the amount of information lost relative to initial learning did not differ significantly between groups across the two retention intervals.

Because the multiple-choice and true-false test item formats used in this study are identical to those used in most Navy introductory technical courses and because of the similarities in the type of information taught in the college course and Navy courses (e.g., names, definitions, principles), it can be concluded that the ability to recognize knowledge learned in Navy technical classrooms will be high even after an 11-month retention interval. Further research is planned to investigate students' ability to recall information learned in school.

NPRDC-TR-91-3
December 1990
(AD-A230 730)

S. W. Sorensen

Developing and Implementing the NEC "C" School Planner (CSCHOOL)

This report describes the development and implementation of the NEC "C" School Planner (CSCHOOL). CSCHOOL organizes data and reports to model the training requirements. The latest version was implemented in 1989 and is being used in the Arlington Annex.

Education and Training

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NPRDC-TR-91-4
January 1991
(AD-A231 711)

C. D. Wetzel
W. H. Wulfeck II

***Low-cost Microcomputer Training Systems Project,
Computer-based Educational Software System: Final
Report***

The Low-cost Microcomputer-based Training Systems project addressed the amount of development effort required to create computer-based instruction (CBI) by instructional developers, the proliferation of nontransportable machine-specific CBI software over incompatible hardware systems, and the opportunity to standardize previously successful CBI software using generative techniques. The project conducted assessments of Navy training patterns relative to CBI, developed the Computer-based Educational Software System (CBESS), and fielded CBESS at representative test sites. CBESS standardizes a set of CBI development and delivery tools in five subsystems which include general CBI programs, a management interface, and three specialized subsystems involving fact memorization, technical vocabulary, and equipment simulation. Instruction developed at test sites spanned several content areas, including threat fact memorization with a videodisc, study skills, mathematics, and electricity and was employed as a supplement to instructor resources for remediation, refresher training, self-study, and repetitive practice.

NPRDC-TR-91-6
March 1991
(AD-A235 114)

L. J. Trejo
M. Inlow
R. R. Stanny
W. A. Morey
S. Makeig
D. A. Kobus
S. A. Hillyard

***The P300 Component of the Auditory Event-related
Potential: Interlaboratory Consistency and Test-retest
Reliability***

The auditory evoked potential in a signal classification task using rare and frequent tones was measured by four independent laboratories, to assess the test-retest reliability and interlaboratory consistency of the P300 component. Across laboratories, 61 male subjects (three samples of military subjects, $N = 25$, $N = 18$, and $N = 8$; one sample of college students, $N = 10$), ranging between 18 and 49 years of age were tested. With few exceptions, all experimental and subject factors were controlled. At each of three electrode sites (Fz, Cz, and Pz), peak amplitude, peak latency, and root-mean-square amplitude (RMS), of the P300 were computed for each subject in test and retest

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conditions. Statistical analyses of the data supported three strong inferences: (1) test-retest reliability and inter-laboratory consistency of P300 measures is high for RMS amplitude, lower for peak amplitude, and lowest for peak latency; (2) recordings from site Pz provide higher reliability and consistency than sites Fz or Cz; (3) the RMS amplitude of P300 is negatively correlated with reaction time to correctly classify rare tones. The data support the notion that ERP components, such as P300, can be reliably measured by different laboratories, with a test-retest correlation coefficient of 0.8 or higher.

NPRDC-TR-91-7
March 1991
(AD-A234 875)

H. L. Pugh
S. W. Parchman
H. Simpson

Field Survey of Videoteletraining Systems in Public Education, Industry, and the Military

The objective of the project was to find more cost-effective ways to train Navy personnel who are geographically remote from existing instructional resources. A field survey was conducted of a representative sample of 13 sites in public education, industry, and the military which are currently using videoteletraining (VTT) to deliver remote-site instruction. The systems surveyed are one of three types: (1) open training networks, (2) closed training networks, and (3) conferencing networks. The majority of training networks use one-way video with two-way audio although the use of two-way video is increasing. There appears to be a trend for VTT systems to form associations to share resources.

NPRDC-TR-91-11
August 1991
(AD-A240 575)

T. Sticht
J. A. Ellis
E. Quellmalz

Enhancing Productivity in Navy Schools: The Use of Wall Posters and Computer-based Instruction to Influence Learning

The project was conducted as part of NPRDC's involvement in the Chief of Naval Education and Training's (CNET) Model School program at the Electrician's Mate "A" School at Great Lakes, IL.

One project objective was to create and evaluate a learning environment in the school outside the classrooms by developing a variety of posters that related to the classroom instructional topics and to the equipment that an electrician

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encounters on the job. A second objective was to apply and evaluate technologies in night study to improve the remediation process. This was accomplished by using available self-paced study materials on basic electricity and by tutoring and counseling by instructors. To enhance this process, computer-based instruction (CBI) was added to the night study classroom.

To evaluate student attitude/responsiveness to the CBI programs and the posters, students were administered a questionnaire. The results suggest that, overall, both posters and CBI programs were used and found to be useful.

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NPRDC-TN-91-11
April 1991
(AD-A236 401)

H. B. Conner
F. H. Hassebrock

Troubleshooting Assessment and Enhancement (TAE)
Program: Theoretical, Methodological, Test, and Evaluation Issues

The purpose of the Troubleshooting Assessment and Enhancement (TAE), R&D effort was to develop, test, and evaluate a computerized system to provide the Navy with a troubleshooting assessment and training capability. This technical note presents the results of the literature review, the theoretical and methodological issues that were to be considered, and the proposed test and evaluation plan for the TAE effort.

NPRDC-TN-91-12
April 1991
(AD-A236 411)

H. B. Conner
C. Poirier
R. Ullrich
T. E. Bridges

Troubleshooting Assessment and Enhancement (TAE)
Program: Design, Development, and Administration

The purpose of the Troubleshooting Assessment and Enhancement (TAE) R&D effort was to develop, test, and evaluate a low-cost, microcomputer-based system to provide an objective measure of the troubleshooting proficiency of Navy technicians. This technical note presents the results of the design and development effort. It provides the system requirements, program design description, TAE software, and the TAE administration guide.

NPRDC-TN-91-13
April 1991
(AD-A236 323)

H. B. Conner
S. Hartley
L. J. Mark

Troubleshooting Assessment and Enhancement (TAE)
Program: Test and Evaluation

The purpose of the Troubleshooting Assessment and Evaluation (TAE) program was to develop a low-cost, microcomputer-based system to provide an objective measure of the troubleshooting proficiency of Navy technicians. The results and conclusions of the test and evaluation of the demonstration system as follows:

1. There was no general statistically significant relationship between experience and TAE troubleshooting performance on the two hypotheses tested. One hypothesis was dropped due to lack of fleet subjects.

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2. There was, generally, no consistent relationship between electronics knowledge and TAE performance on the three hypotheses tested.

3. There was a general and consistent, significant relationship between the electronics performance proficiency measures and TAE performance on the six hypotheses tested.

4. There was a general and consistent, significant relationship between the difficulty of the episodes and the TAE performance on the three hypotheses tested. One hypothesis was dropped due to the lack of fleet subjects.

5. There was a general and consistent, significant relationship between time and TAE results on the two hypotheses tested.

6. There was no significant relationship between test equipment usage and TAE performance results on the one hypothesis tested.

7. There was no significant relationship between the subject rankings and TAE performance on the three hypotheses tested.

NPRDC-TN-91-14
May 1991
(AD-A236 647)

G. L. Jenkins
G. M. Anastasi
J. L. Higgins

Cost/Benefit Analysis of Marine Corps Range Scheduling Systems

This report presents a cost and benefit analysis of two range scheduling systems: the Land Use Management System (LUMS), operational at Camp LeJeune, NC, and the Range Facilities Management Support System (RFMSS), operational at Camp Pendleton, CA. On the basis of lesser costs and greater benefits, RFMSS is recommended as the Marine Corps range scheduling system.

Education and Training

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NPRDC-TN-91-19
August 1991
(AD-A239 664)

B. A. Morris
R. E. Main
J. M. Randel
G. E. Seymour

Front-end Analyses of Three Navy Electrical/Electronics Technical Schools in the Model Schools Program

Front-end analyses were conducted at three electrical/electronics Model "A" schools. Structured interviews identified aspects of "A" school training that impact on student performance. These interviews with administrators, faculty, and students provided information about: (1) facilities, (2) instructor preparation and performance, (3) training methods, materials, and methodologies, and (4) student abilities, motivation, and performance deficiencies. High failure-rate tests and test items and the uncommon vocabulary words associated with high failure-rate test items were identified and documented for segments of the course associated with deficiencies in student performance. Analysis of responses to a Study Factors Survey associated a variety of study factors with test performance. The five study factors with the greatest number of significant correlations with achievement scores were Competition, Concentration, Memorization, Motivation, and Questioning.

NPRDC-TN-91-20
August 1991

P-A. Federico
R. R. Ullrich
B. L. Van de Wetering
C. I. Tomlinson
D. J. E. Long
T. E. Bridges

Human-computer Interfaces for Tactical Decision Making, Analysis, and Assessment Using Artificially Intelligent Platforms: Volume 1, Software Design and Database Descriptions for BATMAN & ROBIN

This report contains the introduction, artificial intelligence techniques, software design, and database descriptions for the Battle-Management Assessment System and Raid Originator Bogie Ingress (BATMAN & ROBIN). These software systems are being developed to assess how well individuals can allocate, deploy, and manage air, surface, and/or subsurface tactical assets during simulated sea battles in many warfare areas. Together they form a desk-top, computer-based, performance-measurement system incorporating high resolution graphics, low level modelling, artificial intelligence techniques, to fill the gap between board games that are run in real or fictitious time with subjective assessment and inappropriate feedback and very expensive and man-hour-intensive, mainframe-based simulators. Two of the major contributions of these dual

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systems are very friendly human-computer interfaces and automated performance assessment. Because of the nature of their generic software and independent databases, as well as the potential for incorporating different computer models, BATMAN & ROBIN can be used for a variety of functions: (1) training and testing tactical knowledge; (2) planning and decision aiding for tactical situations; (3) developing and evaluating tactics themselves; (4) analyzing and evaluating various tactical sensor, weapon, and communication systems; (5) front-ending sophisticated tactical computer models and complex databases; (6) interfacing tactical artificial intelligent and expert systems; (7) generating rapidly scenarios for tactical trainers; (8) prototyping complicated scenarios for major wargaming systems; (9) orienting novices to facets of naval warfare; (10) evaluating tactical display symbologies and formats; and (11) providing an experimental environment for studying tactical decision making.

NPRDC-TN-91-25
September 1991
AD-A242 067

A. M. Megrditchian
A. Moranville

Rating Training Continuum: Evaluation Plan

The Deputy Chief of Naval Operations (Manpower, Personnel and Training (OP-01)) tasked NPRDC to construct a training continuum design methodology using the Operations Specialist (OS) and Electronics Warfare Technician (EW) ratings as the design vehicles. Rating Training Continuum Development Workshops were held for the OS and EW ratings in FY89 and FY90. The results of the workshops were incorporated into Continuum Training Plans (CTPs). NPRDC then developed an evaluation plan to determine the effectiveness of the OS and EW CTPs. The first step in the evaluation is to verify that the recommendations in the CTPs have been implemented into the OS and EW training pipelines. Implementation will be established by surveying the implementing and using agencies, and examining course materials. The second step in the evaluation is to measure the effect of the recommendations on OS and EW personnel and on their training pipelines. Four attributes will be measured: Job performance, force structure, training effectiveness, and career attitude. Existing organizational data, surveys, and interviews will be used to obtain the necessary data on the tributaries. Descriptive and inferential statistics will be used to analyze the data.

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NPRDC-TR-91-9
April 1991
(AD-A234 550)

D. J. Murphy
D. A. Tyburski
E. P. Somer
P. G. Roth
R. S. Higdon
C. E. Newel

Office of Civilian Personnel Management Survey of Navy Civilian Attitudes December 1989: Findings

NPRDC, in cooperation with the Navy Office of Civilian Personnel Management, developed the Navy Civilian Personnel Survey (NCPS). In December 1989, NCPS was administered to a random sample of 3,629 Navy civilian employees. The number of usable responses was 1,958, about 54 percent of the original sample. The survey data were generally representative of the entire civilian workforce to within ± 5 percent error. NCPS examined attitudes in the following areas: job satisfaction; current programs, policies, and practices (including recruiting; pay and benefits; working hours; training; management, supervision, and feedback; promotion system; equal employment opportunity; overseas employment; and retirement); and planned and proposed programs and policies (including job sharing, leave transfer, health/wellness programs, child care, elderly dependent care, drug testing, and Acquired Immune Deficiency Syndrome (AIDS) in the workplace).

NPRDC-TR-91-10
July 1991

J. Shettel-Neuber
J. P. Sheposh
C. A. Hayashida
H. Arbor
R. Cooke
W. McNulty
P. C. St. Clarie
P. Trusso

Experimental Civilian Personnel Office Project (EXPO): Final Report for Nonappropriated Fund Sites

The purpose of this report is to document the evaluation of the Experimental Civilian Personnel Office Project (Project EXPO). The aim of Project EXPO was to design and test initiatives that streamlined and simplified personnel management procedures and policies employed in the Department of Defense. Seventeen nonappropriated fund (NAF) sites were evaluated: two U.S. Army, Europe, activities located in Heidelberg and Stuttgart, West Germany; two Army sites under the Training and Doctrine Command; eight Air Force installations, one in Europe, one in the Pacific, and six in the Continental U.S., and five Navy sites, four in the U. S. and one in Spain. NAF sites generate income through some of their activities such as bowling centers and golf courses. The initiatives implemented were designed to (1) enhance the responsiveness, flexibility, and cost-effectiveness of the personnel system and (2) enable the NAF activities to operate in

Organizational Systems

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NPRDC-TR-91-12
September 1991
(AD-A241 011)

B. C. Tatum
D. M. Nebeker
S. W. Sorensen

a manner similar to that of private businesses. The evaluation covered a 2-year test period. Data sources included attitudinal surveys; standardized on-site interviews of personalists, managers, and supervisors; existing databases; budgetary data; and other documents provided by the test sites. The results indicate that EXPO initiatives had a positive impact on NAF operations.

Work Standards, Productivity, and Quality

W. Edwards Deming claims that standards should be eliminated because they focus on the quantity of work produced to the detriment of work quality. The present study examined the effects of production standards on work quantity and quality. Thirty-seven employees were hired to perform a "database management" task in a simulated work environment. The first week was the baseline period for productivity (keystrokes per hour) and work quality (percent key entry errors). During the second week, the workers were divided into two control groups and four experimental groups. The control groups differed only in that one group received feedback on its productivity and the other group received no feedback. The four experimental groups represented four levels of work standards (80%, 90%, 110%, and 120% of baseline). The workers were divided into underachievers and overachievers. The underachievers showed a marked increase in keystrokes per hour as the standards increased. Key entry errors for underachievers and overachievers were unaffected by the standards, except that the overachievers made more errors than the underachievers for the moderately high (110%) standard. In general, there was no evidence that productivity increases were related to declines in work quality. Responses to job satisfaction and stress questions revealed no differences between any of the groups. Specific task strategies were identified that might explain how workers were able to increase production without sacrificing quality.

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NPRDC-TN-91-17, Volume 1
August 1991
(AD-A239 833)

Navy Personnel Survey (NPS), 1990, Survey Report, Statistical Tables, Enlisted Personnel

Volume 2

Navy Personnel Survey (NPS), 1990, Survey Report, Statistical Tables, Officer Personnel

Volume 3

Navy Personnel Survey (NPS), 1990, Survey Report, Graphical Representations, Enlisted Personnel

Volume 4

Navy Personnel Survey (NPS), 1990, Survey Report, Graphical Representations, Officer Personnel

M. A. Quenette
S. Kalus
J. Hase
C. Brinderson

The purpose of the Navy Personnel Survey was to gather timely information on issues of importance to policy makers. In October 1990, the questionnaire was mailed to 23,906 officers and enlisted personnel; 11,809 were completed and returned for an adjusted return rate of 52 percent. Respondents were asked to provide demographic data and to indicate their attitudes or opinions on rotation/permanent change of station (PCS) moves, recruiting duty, pay and benefits, training and education programs, quality of life, organizational climate, and Acquired Immune Deficiency Syndrome (AIDS) education. Analyses were based on data which were weighted to correct for under- or over-sampling of subpopulations; thus, inferences may be made to the Navy population.

Administrative Publications

NPRDC-AP-91-2
November 1990
(AD-A229 911)

P. G. Roth
D. J. Murphy

Office of Civilian Personnel Management Survey of Navy Civilian Attitudes December 1989: Management Report

NPRDC, in cooperation with the Navy Office of Civilian Personnel Management, developed the Navy Civilian Personnel Survey (NCPS). In December 1989, NCPS was administered to a random sample of 3,629 Navy civilian employees. The number of usable responses was 1,958, about 54 percent of the original sample. The survey data were representative of the entire civilian work force at the 95 percent level of confidence, +/- 5 percent error. NCPS examined attitudes in the following areas: recruiting, pay and benefits, job satisfaction, and training.

NPRDC-AP-91-6
December 1990
(AD-A231 400)

R. G. Dalton

Bibliography of Reports and Journal Articles Approved for Public Release: FY90

This report lists all technical reports, journal articles, technical notes, and administrative publications approved for public release in FY89. Publications in each category are listed in chronological order under the following areas: manpower, personnel, testing systems, education and training, organizational systems, and administrative publications.

NPRDC-AP-91-7
February 1991

T. M. I. Yellen
C. C. Scheifers

Technical Information Office User's Guide

The Technical Information Office (TIO) provides a variety of support services which focus on accomplishing the Center's informational needs. The office plans and operates the Center's public affairs program; prepares and publishes various publications designed to inform military and civilian audiences about Center RDT&E activities, accomplishments, areas of technical expertise, and employment opportunities; prepares material for Command level presentations, briefings, demonstrations, and exhibits; maintains historical files; provides graphic arts, photographic services, automated publishing, reports processing, technical library services, audio-visual production consultation and equipment maintenance/repair; and serves as the Center Coordinator for Domestic Technology Transfer, Freedom of Information Act, Privacy Act, and Hazardous Materials.

Administrative Publications

NPRDC-AP-91-10
March 1991

E. P. Somer

Navy Personnel Survey Program

The Navy Personnel Survey Program provides survey-based information to the Department of the Navy and other Department of Defense agencies. The primary focus is personnel surveys. Of particular concern are attitudes, opinions, and perceptions of military and civilian personnel.

Each survey is closely tailored to customer need, developed within scientific/statistical guidelines, and designed to minimize disruption of normal command operations.

In addition, the Center conducts research to improve survey methodology and technology. Part of its mission is to manage and coordinate all Navy surveys. The Center maintains an information database on surveys administered by other Navy agencies.

NPRDC-AP-91-11
April 1991

T. M. I. Yellen
C. C. Scheifers

Seapower Through People

This brochure contains a description of NPRDC's operating philosophy, reporting relationships within the Department of the Navy, current programs, and location maps.

NPRDC-AP-91-12
April 1991

Top 10 Products for 1990

This publication describes selected major products developed during 1990 by NPRDC.

NPRDC-AP-91-14
May 1991
(AD-A236 592)

A. V. Stout
C. C. Scheifers

Command History for 1990

This report lists NPRDC's mission, functions, organization, commanding officer/technical director biographies, key personnel, chronology of 1990 events, history of the Center, resources (financial, personnel, facilities), research and development program, and publications and presentations.

Administrative Publications

NPRDC-AP-91-15
June 1991
(AD-A240 145)

W. E. Montague
C. C. Scheifers
(Editors)

***Independent Research and Independent Exploratory
Development Programs: FY90 Annual Report***

This report documents the activities and accomplishments of the Independent Research (IR) and Independent Exploratory Development (IED) programs at NPRDC for FY90. In addition to the technical presentations, program administrative information is provided.

NPRDC-AP-91-16
July 1991
(AD-A240 803)

Project Profiles

Project Profiles contains information about the kinds of work currently being conducted at NPRDC. This publication contains brief descriptions of selected efforts.

NPRDC-AP-91-17
August 1991
(AD-A240 146)

G. L. Wilcove
E. W. Kerce

***Survey Results from the Department of the Navy Family
Support Conference***

NPRDC was requested to survey attendees at the 1988 Department of the Navy Family Support Conference and to analyze survey results. One purpose of this survey was to solicit opinions on the issues that will confront Navy and Marine Corps families in the year 2000. A second purpose was to solicit evaluations of family support services so that effective services could be differentiated from ineffective ones. According to survey respondents, the top five areas of concern in the year 2000 will focus on quality of life, family support, care of aging parents, needs of the child, and spouse employment. Respondents favorably evaluated family support programs, particularly Family Service Center (FSC) Counseling, FSC Information and Referral Services, the Ombudsman Network, Family Member Employment Assistance, and Deployment Support Programs.

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NPRDC-TR-91-3	12	<i>Developing and Implementing the NEC "C" School Planner (CSCHOOL)</i>
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NPRDC-TR-91-10	20	<i>Experimental Civilian Personnel Office Project (EXPO): Final Report for Nonappropriated Fund Sites</i>
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Chief of Naval Technical Training (Code 00)
Commanding Officer, Naval Technical Training Center, Corry Station, Pensacola, FL
Chief of Naval Personnel
Deputy Chief of Naval Personnel (PERS-00B), (PERS-00W), (PERS-01JJ), (PERS-013D),
(PERS-11), (PERS-11C), (PERS-116), (PERS-02), (PERS-20), (PERS-22), (PERS-03),
(PERS-04), (PERS-40), (PERS-46), (PERS-47), (PERS-05), (PERS-06), (PERS-07), (PERS-
71), (PERS-72)
Commander, Navy Recruiting Command
Commander, Naval Training Center, San Diego, CA

Distribution List

Commander, Naval Training Center, Great Lakes, IL
Commander, Naval Training Center, Orlando, FL
Commanding Officer, Recruit Training Command, San Diego, CA
Commanding Officer, Service School Command, San Diego, CA
Commanding Officer, Service School Command, Great Lakes, IL
Commanding Officer, Fleet Training Center, Naval Station, San Diego, CA
Commanding Officer, Service School Command, Naval Training Center, Orlando, FL
Director, Command Career Counselor Course, San Diego, CA (Code 3W34)
Officer in Charge, BUMED East Coast Equal Opportunity, Naval Regional Medical Center, Portsmouth, VA
Officer in Charge, BUMED West Coast Equal Opportunity, Naval Regional Medical Center, Oakland, CA
Commanding Officer, Sea-Based Weapons and Advanced Tactics School, Pacific
Chief, Bureau of Medicine and Surgery, Washington, DC
Commanding Officer, Naval Aerospace Medical Research Laboratory, Pensacola, FL
Commanding Officer, Naval Health Sciences Education and Training Command, Bethesda, MD
Commanding Officer, Naval Hospital, Portsmouth, VA (Medical Library)
Commanding Officer, Naval Hospital, San Diego, CA (Alcohol Rehab Service)
Officer in Charge, Navy Occupational Development and Analysis Center, Washington, DC
Commander, Naval Reserve Force, New Orleans, LA
Commanding Officer, Enlisted Personnel Management Center, New Orleans, LA
Commander in Chief, U.S. Atlantic Fleet
Commander in Chief, U.S. Pacific Fleet
Commander in Chief, U.S. Naval Forces, Europe (2)
Commanding Officer, Readiness Training Facility, Ferndale, CA
Commander, Oceanographic System, Atlantic
Commander, Oceanographic System, Pacific
Commander, Naval Air Force, U.S. Atlantic Fleet
Commander, Naval Air Force, U.S. Pacific Fleet
Commander, Naval Surface Force, U.S. Atlantic Fleet
Commander, Naval Surface Force, U.S. Pacific Fleet
Commander, Submarine Force, U.S. Atlantic Fleet
Commander, Submarine Force, U.S. Pacific Fleet
Commander, Submarine Force, U.S. Pacific Fleet
Commander, Training Command, U.S. Atlantic Fleet
Commander, Training Command, U.S. Atlantic Fleet
Commander, Training Command, U.S. Pacific Fleet
Commander, Fleet Training Group, U.S. Atlantic Fleet

Distribution List

Commander, Fleet Training Group, U.S. Pacific Fleet
Commander, Submarine Group 2
Commander, Patrol Wings, U.S. Atlantic Fleet
Commander, Patrol Wings, U.S. Pacific Fleet
Commander, Anti-Submarine Warfare Wing, U.S. Pacific Fleet
Commander, Sea Based ASW Wing, U.S. Atlantic Fleet
Commanding Officer, Fleet Aviation Specialized Operational Training Group, U.S. Atlantic Fleet
Detachment Jacksonville, Fleet Aviation Specialized Operational Training Group, U.S. Atlantic Fleet
Commanding Officer, Fleet Aviation Specialized Operational Training Group, U.S. Pacific Fleet
Commander, Air Anti-Submarine Wing 1, U.S. Atlantic Fleet
Commander, Helicopter Sea Control Wing 1, Naval Air Station, Norfolk, VA
Commandant of the Marine Corps
Commanding General, Marine Corps Research Development and Acquisition Command
Commandant of the Marine Corps (Assistant DC/S M&RA), (MP), (MIS), (MPP-20), (MPP-30), (MR), (MRM), (MPP), (MRRE), (MRRP), (MM), (MMEA), (MA), (TE-31T)
Marine Corps Research, Development, and Acquisition Command (MCRDAC), Quantico, VA
Marine Corps Combat Development Command (MCCDC), Quantico, VA
Marine Corps Deputy CG (PM Training Systems)
Commander, U.S. ARI, Behavioral and Social Sciences, Alexandria, VA (PERI-POT-I)
Technical Director, U.S. ARI, Behavioral and Social Sciences, Alexandria, VA (PERI-ZT)
U.S. ARI, Behavioral and Social Sciences, Alexandria, VA
Director, Army Tradoc Systems Analysis Activity, White Sands Missile Range, NM (ATTA-SL)
Commander, Army Soldier Support Center, Human Dimensions Division, Fort Benjamin Harrison, IN
Department of the Air Force, DET 5, Armstrong Laboratory Directorate, Brooks Air Force Base, TX
Department of the Air Force (AFSC), Air Force Human Resources Laboratory (AFHRL/ID), Brooks Air Force Base, TX
Armstrong Laboratory, Human Resources Manpower
Armstrong Laboratory, Scientific and Technical Information (STINFO) Office
Armstrong Laboratory, TSRL/Technical Library (FL 2870)
Director, Training Systems Development, Randolph Air Force Base, TX (Hq ATC/XPRS)
Director, Technical Reference Library, Gunter Air Force Station, AL (AFLMC/XRU)
Director, Equal Opportunity Management Institute, Patrick Air Force Base, FL (EOMI)
Commander, Headquarters Lackland Air Force Base, TX (AFMTC/XR)
Library, Coast Guard Headquarters
Commanding Officer, U.S. Coast Guard Research and Development Center, Avery Point, Groton, CT

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Commanding Officer, U.S. Coast Guard Support Center, Government Island, Alameda, CA
Director, Office of Civilian Personnel Management
President, Naval War College (Code E-1121)
Superintendent, Naval Postgraduate School
Superintendent, U.S. Coast Guard Academy (DH)
Commanding Officer, U.S. Coast Guard Institute
President, National Defense University
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Director of Research, U.S. Naval Academy
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Commandant, Defense Systems Management College, Ft. Belvoir, VA
Executive Director, U.S. Naval Institute
Program Manager, Manpower Research and Advisory Service, Smithsonian Institution
Institute for Defense Analyses, Science and Technology Division
Center for Naval Analyses